Assignment 5

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2018-09-12, 23:59 IST.

1) The critical points of the autonomous system
\[
\frac{dx}{dt} = x - 2y + 3, \quad \frac{dy}{dt} = x - y + 2
\]
are given by

- (0, 0), (2, 3)
- (1, -1)
- (1, 1)
- (-1, 1)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(-1, 1)

2) The nature of critical point (0, 0) for linear autonomous system
\[
\frac{dx}{dt} = 2x, \quad \frac{dy}{dt} = 3y,
\]
is a

- Node
- Saddle point
- Spiral point
- Center

No, the answer is incorrect.
Score: 0
Accepted Answers:
Node

3) The nature of critical point (0, 0) for linear autonomous system
\[
\frac{dx}{dt} = -3x + 4y, \quad \frac{dy}{dt} = -2x + 3y,
\]
Spiral point
Center
No, the answer is incorrect.
Score: 0
Accepted Answers:
Saddle point

4) The nature of critical point \((0,0)\) for linear autonomous system
\[
\frac{dx}{dt} = -x - 2y, \quad \frac{dy}{dt} = 4x - 5y,
\]
is a

Node
Saddle point
Spiral point
Center
No, the answer is incorrect.
Score: 0
Accepted Answers:
Spiral point

5) The nature and stability property of critical point \((0,0)\) for linear autonomous system
\[
\frac{dx}{dt} = 5x + 2y, \quad \frac{dy}{dt} = -17x - 5y,
\]

an asymptotically stable center

a stable but not asymptotically stable center
unstable node
an asymptotically stable spiral
No, the answer is incorrect.
Score: 0
Accepted Answers:
a stable but not asymptotically stable center

6) The nature and stability property of critical point \((0,0)\) for linear autonomous system
\[
\frac{dx}{dt} = -4x - y, \quad \frac{dy}{dt} = x - 2y,
\]

an asymptotically stable spiral
an asymptotically stable node

a stable but not asymptotically stable center
unstable node
No, the answer is incorrect.
Score: 0
Accepted Answers:
7) The nature and stability property of critical point (0, 0) for linear autonomous system
\[
\frac{dx}{dt} = 4x - 2y, \quad \frac{dy}{dt} = 5x + 2y,
\]
is
- an unstable node
- an asymptotically stable spiral
- an asymptotically stable node
- an unstable spiral

No, the answer is incorrect.
Score: 0
Accepted Answers:
- an unstable spiral

8) The nature and stability property of the simple critical point (0, 0) for non-linear autonomous system
\[
\frac{dx}{dt} = x + y - 2xy, \quad \frac{dy}{dt} = -2x + y + 3y^2,
\]
is
- an asymptotically stable node
- an asymptotically stable spiral
- an unstable spiral
- an unstable node

No, the answer is incorrect.
Score: 0
Accepted Answers:
- an unstable spiral

9) The nature and stability property of the simple critical point (0, 0) for non-linear autonomous system
\[
\frac{dx}{dt} = -x - y - 3x^2y, \quad \frac{dy}{dt} = -2x - 4y + y\sin x,
\]
is
- a stable but not asymptotically stable node
- an asymptotically stable node
- an unstable saddle point
- an asymptotically stable spiral

No, the answer is incorrect.
Score: 0
Accepted Answers:
- an asymptotically stable node

10) The nature and stability property of critical point (0, 0) for linear autonomous system
\[
\frac{dx}{dt} = x + 4y - x^2, \quad \frac{dy}{dt} = 6x - y + 2xy
\]
No, the answer is incorrect.
Score: 0
Accepted Answers:
an unstable saddle point